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⑤④ **Metallic blind formed by assemblable components.**

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⑤⑥ References cited:
DE-A-2 859 741
LU-A-57 802
US-A-2 311 122

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Description

The invention relates to blind assembly, in preference an aluminium alloy blind assembly to be mounted in the space defined by a metallic frame having a standard suitable section and used for glass doors or glass windows; the blind assembly being formed by an assortment of assemblable preferably metallic, extruded sections and connecting devices and having adjustable slats which may, if necessary, be lockable.

At present, the metallic blind assemblies with tilting slats are built with old technologies: for example all assembling means of the frame and of the slats as well as the necessary workings are of traditional type, i.e. screws, rivets, boring of holes for the pins of the slats and so on.

Therefore, the manufacturing of these types of blinds requires various equipments and waste of time that increase the cost and do not permit the immediate assembling in the erecting yard by fitters. From DE-A-2 859 741 a blind assembly is known, which has the features of the prior art part of claim 1. The tilting slats are coupled to cog-wheels which are rotated by means of racks secured to a single metallic bar.

The components of the blind assembly, such as the slats, the cogwheels and the racks are assembled by using ordinary connecting means and various standard equipments.

The invention as claimed is intended to remedy these drawbacks.

It solves the problem of how to design a blind assembly with tilting slats in which all the component parts are of interconnecting type, to permit the immediate construction of the blind assembly only by cutting the extruded standard section of its frame to the proper length.

The advantages offered by the invention are not only to the handicraftsmen and assemblers but also to all people that want to make a blind with tilting and lockable slats by themselves.

The invention is described in detail below with references to drawings which illustrate some embodiments in which:

- fig. 1, is an exploded view of the blind in accordance with the invention;
- fig. 2, is an external view of the blind;
- fig. 3, is an external view of the blind with slats in the open position;
- fig. 4, is the cross section XX of fig. 2;
- fig. 5, is the cross section YY of fig. 2;
- fig. 6, is the cross section X'X' of fig. 3;
- fig. 7, is the cross section Y'Y' of fig. 3;
- fig. 8, is the perimetral extruded section;
- fig. 9, are the fixed upper and lower slats;
- fig. 10, is the compensating extruded section;
- fig. 11, are slats with coupling devices;
- fig. 12, is an exploded view of the coupling device 3;
- fig. 13, shows the insertion of the rack devices;
- fig. 14, is an exploded view of the rack device;
- fig. 15, is an exploded view of the slat with interruptions of the thermic conduction.

The blind has been designed so as to be inserted in the frames of a glass window or a glass door made by suitable extruded aluminium sections of standard type, marketed as mass product under different names, as illustrated in figure 1.

It is composed by the following parts;

- 1) a set of aluminium alloy and plastic rigid material extruded sections;
- 2) a set of extruded plastic material gaskets;
- 3) a set of fittings made of pressed plastic materials.

The 1) set is composed in detail by:

- The perimetral extruded sections 1 (fig 8) with a longitudinal opening 1e in whose interior 1a there are two longitudinal spacers 1b; the section is also furnished with a longitudinal slot 1c for the insertion of light and wind seal gasket 10 and, on the external surface, with two longitudinal spacers 1d.

- The slats 2 having a longitudinal hollow 2a (fig 11) and a longitudinal edge forming a slot 2b, the hollow 2a to contain, at both ends, the coupling devices 3 furnished with pins 4 (fig 12) to engage in the hole 12b (fig 13) of the rack devices, the slot 2b to contain the gasket 5 of extruded plastic material as light and wind seal between slats. The slats, in the preferred embodiment, have a pitch of 60 mm.

- The sections of the two fixed terminal slats, that is the upper 6 and lower 7, are spring inserted in the longitudinal opening 1e of the respectively upper and lower horizontal perimetral sections. The section 7 forms a slot 7a (fig 9) to insert gasket 5 for light and wind sealing.

- A slat of type with interruption of the thermic conduction, formed by two aluminium semi-slats 8a and 8b (fig 15) and an intermediate plastic section 8c, which have a pressure lock connection through insertion of the longitudinal fin 8b1 in the slot 8c1 of the plastic section and of the longitudinal fin 8a1 in the slot 8c2 of the same section 8c. Section 8b forms a slot 8b2 in which the gasket section 5 is inserted; in the preferred embodiment, the slats have a 60mm. pitch.

- A compensating section 9 (fig 10), of 10 mm. thickness, to be inserted in the upper and lower horizontal sides of the window frame before applying the perimetral section 1, to allow, in the preferred embodiment, the recovery of the eventual centimetres of the height of the frame which are not covered by the slats which can only cover window frames having an height multiple of 60 mm.

The 2) set of elements is formed by the gasket 10 (fig 1) made of the aforesaid extruded material, with rigid base 10a and flexible fin 10b to be inserted in the slot 1c of the perimetral section 1 to be mounted vertically.

Alternatively, to this gasket can be used a normal seal brush of commercial standard.

The coextruded gasket section 5, is provided with a rigid base 5b and a flexible fin 5a and is also inserted in the longitudinal slot 8b2 of the

slats having thermic interrupti ns.

The 3) set is f rmed by pla tic auxiliary components obtained with a pressing process, that is by:

- rack devices 11 (figs 13 and 14) to cause the rotation of slats 2 through the pins 4, each made of two plates 11a perfectly identical and coupling each other through symmetrical spring joints.

Each rack device contains one sector 12 of a cog-wheel and a rack bar 13 placed respectively in their proper housing 11a1 and 11a2, the cog-wheel 12 being integral with the hub 12a which itself, in its interior, is axially pierced in such a way as to form a hole 12b, frustum of cone shaped.

The rack device is completed at one end by a head-shaped appendix 13a and at the other end by a slot 13b of the same shape of the said appendix, in such a way that it is possible to connect in series several rack devices to form a single long rack.

Coupling devices 3 for each mobile slat, respectively symmetric so as to be inserted in both ends of the slat itself, which are both also formed by two equal parts, 3a and 3b coupled by pegs 3b3 to insert in the holes 3a3 of the part 3, each device containing a tapered pin 4 reactioned by a spring 14.

Spring 14 has the function to push the pin through the hole 3c1 outwards from the device, to insert it in the frustum of cone shaped hole 12b in the hub of the cog-wheel 12.

Each coupling device 3 is one with a stop-plate 3c which has the function to plug the end of the slat and, when the said slat is in a vertical, that is closed position, to compress the gasket 10 towards the vertical perimetral metallic section 1 which contains it. The coupling devices which are inserted in the hollow 2a of the normal slats, may also be inserted in the 8c8 hollow of the intermediate plastic section of the slats 8 after removing the edge 3a1 of the plate 3a and 3b1 of the plate 3b.

The plates 3a and 3b are also provided with clefts 3a2 and 3b2 to make easier the support of spring 14.

Closing plugs respectively at the right and left end of the fixed terminal slats and blocking plugs applied to the ends of the vertical perimetral metallic section to block the rack boxes and avoid sliding of the rack when this is in use.

The assembling of the elements composing the blind is achieved by cutting to precise measure the four perimetral sections 1 with a cut orthogonal to the longitudinal axis, and by inserting themselves between slide battens 15a of sections 15 which form the frame of the glass-window or glass-door, to obtain the locking of the spacers 1d in the said battens 15a and, therefore, the coupling of perimetral section 1 with the frame 15 itself.

For this purpose, first, the horizontal upper and lower elements should be mounted so as to fill the whole width of the frame span and, successively, the two vertical elem nts in which

have already been inserted the rack devices 11 mutually connected by inserting end 13a in the slot 13b of the contiguous bars 13 and, having at the ends, the blocking plugs. The vertical perimetral sections 1 are fixed to frame 15 without the use of fixing screws or rivets because of the pressure exerted by the spring pins 4 mounted in the coupling devices 3 inserted in the hollow 2a on each of the slats 2, pressure that is exerted when the same pins have been inserted in the holes 12b inside the cog-wheel hub 12 mounted in each rack devices.

The horizontal elements of the perimetral sections 1 remain also, connected to the frame 15 of the window frame without the use of fixing screws or rivets, because of the matching against the cross area at the ends of the vertical 1.

The slats 2 are applied after having mounted the terminal upper and lower fixed slats respectively 6 and 7 in the longitudinal opening 1e of the horizontal section 1 and after having applied the blocking plugs to both ends.

The rack devices 11 allow to obtain any length of rack and, therefore, are adaptable to window frames of different heights: in the preferred embodiment, the rack bars 13 have a length of 60 mm.

The rack device 11 can be operated through a knob 16 to be inserted in the threaded hole 13c of the rack bar, so as to rotate by means of the same rack bar the cog - wheel sector 12 which forces the slat joined to it throught the conical pins 4, to rotate around its own axis. Because of obtaining a single rack bar by coupling together a set of rack devices, it is sufficient to operate one of the elements which compose the set itself, to operate the cog-wheels of all the other racks and therefore their respective slats.

The invention may differ from the described execution because of the variation in the dimension of the elements which compose the blind and in the use of different materials. In fact, the blind can be manufactured with materials other than aluminium or plastic, for example, stainless steel, if one wants to produce burglar-proof blinds or blinds for any other applications.

In the preferred embodiments, the dimension of the sections 1 are of mm. 20x40, while those a,b,c, of the slats are respectively mm. 72, 58, 44.

The metallic slats 2 can be substituted by plates 2/1 made of glass or other materials as, for example, wood or stratified plastic rolled sections.

The coupling device of Fig. 11 is modified as in 3/1 so as to include one end of the slat 2/1.

The knob 16, in its turn, can be substituted by a device 17 as illustrated in Fig. 14, operated by means of a handle 17a, lockable in the preferred position through the small peg 17b; the handle operates the rack bar 17c of the device 17 to apply to the rack 13, by inserting the pin 17d of square cross-section in the hole 13c; so to avoid the rotation of the slat from outside.

In a further mbodiment, the knob to rotate the slats, may be substituted by a lever to connect to

the coupling device 3: in this way the cut 1f in the section 1 is avoided, this cut being necessary to allow the pin of the knob 16 or of the pin 17 of the device 17 to slide.

Claims

1) A blind assembly particularly for insertion within the aluminium frame (15) of a fixed or movable glass window or glass door, comprising a perimetral frame (1) having both vertical and horizontal sides formed from a standard suitable section, a plurality of slats (2), and means located within a said vertical perimetral frame section (1) for rotating the slats (2) between open and closed positions, said means including for each slat a cog wheel member (12) non-rotatably connected to the slat and meshing with a respective single slidable rack (13), said racks being coupled for simultaneous movement, characterised in that each rack (13) is slidably received in a respective rack box (11), a respective rack box being provided at each end of each slat (2), each rack box (11) enclosing also said cog wheel member which is in the form of a cog wheel sector (12), that each cog-wheel sector has a tapered non-circular hole (12b) receiving a complementary shaped tapered pin (4) of a coupling device (3) mounted in each end of each slat (2), each coupling pin (4) being biased outwardly by a spring (14) in the coupling device (3), to retain the pin (4) in the tapered hole (12b) of the cog-wheel sector (12) and to maintain the vertical perimetral sections (1) against the window or door frame, and that a pair of fixed slats (6,7) is provided, each being received in an opening (1e) of a respective one of the upper and lower perimetral frame sections (1).

2) A blind assembly as claimed in claim 1, characterized in that the vertical sections are connected to the frame (15) by inserting two battens (1d) of the section within two battens (15a) of the frame (15).

3) A blind assembly as claimed in claim 1, characterized in that the slats can rotate in a range from 0° to 180°, choosing a cog-wheel sector of a variable angle between 0° and 180°.

4) A blind assembly as claimed in claim 1, characterized in that the slats can have one or more interruptions of the thermic conduction.

5) A blind assembly as claimed in claim 1, characterized in that each rack box (11) is formed of two parts (11a) exactly alike and joined together, each cog-wheel sector (12) has a coaxial hole (12b) which receives for the pin (4) of the coupling device (3), and each rack (13) is provided at one end with an appendix (13a) and at the other end with a slat (13b) of the same shape, to allow several racks to be connected so as to form an uninterrupted longer rack-bar.

6) A blind assembly as claimed in claim 1, characterized in that, each coupling device (3) consists of a plate (3c) of shape similar to the

cross-section of the said slat, solid with a plate (3a) orthogonal to it, and shaving a rectangular clift (3a2), to which by pressure is coupled another plate (3b) of the same shape, through small pegs (3b3).

7) A blind assembly as claimed in claim 1, characterized in that the sliding of the rack (13) to rotate the slats (2) may be executed through a knob (16) or a device (17) furnished with a handle (17a) lockable in a preferred position or by means of a lever connected to the coupling devices (3) or (3/1).

8) A blind assembly as claimed in claim 1, wherein each slat (2) is formed by two half slats (8a) and (8b) having fins (8a1) and (8b1) inserted in corresponding slots (8c1) and (8c2) of a plastic intermediate section (8c), a hollow (8c3) of the same intermediate plastic section permitting the coupling, at the two ends, to the coupling devices (3).

Patentansprüche

1. Eine zusammengesetzte Jalousie, besonders geeignet zur Montage an den Aluminiumrahmen (15) beweglicher oder fester Fenster oder Glastüren, bestehend aus einem Außenrahmen (1) mit horizontalen und vertikalen Teilen aus serienmäßigen Profilen geeigneten Durchmessers, einer Anzahl von Lamellen (2) und an den o.g. vertikalen Profilen (1) montierten Vorrichtungen zum Öffnen und Schließen dieser Lamellen (2), die für jede Lamelle ein mit ihr verbundenes und in eine bewegliche Zahnstange (13) reichendes Zahnrad (12) enthalten, wobei diese Zahnstangen (13) untereinander verbunden sind zur Erzeugung einer simultanen Bewegung, die dadurch gekennzeichnet ist, daß jede Zahnstange (13) beweglich in ein jeweils an den Enden der Lamellen (2) angebrachtes und auch das obengenannte Zahnrad (12) umfassendes Zahngehäuse (11) eingefügt ist wobei jedes Zahnrad eine nicht runde kegelförmige Öffnung (12b) zur Einführung eines kegelförmigen Zapfens (4) einer an beiden Enden jeder Lamelle (2) montierten Verbindungsvorrichtung (3) hat und jeder dieser Verbindungszapfen (4) durch eine Feder (14) an die Außenseite der Verbindungsvorrichtung (3) gedrückt wird, um den Zapfen (4) in der kegelförmigen Öffnung (12b) des Zahnrades (12) zurückzuhalten und um die äußeren vertikalen Profile (1) gegen den Rahmen des Fensters oder der Tür zu drücken, während oben und unten zwei Lamellen (6,7) fest montiert sind, indem sie jeweils in einen Schlitz (1e) der jeweiligen horizontalen Profile (1) des Rahmens (15) gesteckt werden.

2. Eine zusammengesetzte Jalousie wie in Anspruch 1 beschrieben, dadurch gekennzeichnet daß die vertikalen Profile mit dem Rahmen des Fensters oder der Tür (15) so verbunden sind, daß die beiden Bordüren des

Querschnitts (1d) in die beiden Leisten (15a) des Rahmens (15) eingefügt werden.

2. Eine zusammengesetzte Jalousie wie in Anspruch 1 beschrieben, dadurch gekennzeichnet, daß die Lamellen mit einem Teilzahnrad mit einem variablen Scheitelwinkel von 0° - 180° in einem variablen Winkel von 0° - 180° gedreht werden können.

4. Eine zusammengesetzte Jalousie wie in Anspruch 1 beschrieben, dadurch gekennzeichnet, daß die Lamellen eine oder mehrere Unterbrechungen der Wärmeleitfähigkeit enthalten.

5. Eine zusammengesetzte Jalousie wie in Anspruch 1 beschrieben, dadurch gekennzeichnet, daß jedes Zahngehäuse (11) aus zwei genau gleichen miteinander verbundenen Teilen (11a) besteht und daß jedes Zahnrad (12) eine koaxiale Öffnung (12a) zur Aufnahme des Zapfens (4) der Verbindungsvorrichtung (3) hat und daß jede Zahnstange (13) auf einer Seite mit einem Fortsatz (13a) und auf der anderen Seite mit einer Nut (13b) in der gleichen Form versehen ist, um dadurch eine längere, ununterbrochene Zahnstange zu bilden.

6. Eine zusammengesetzte Jalousie wie in Anspruch 1 beschrieben, gekennzeichnet dadurch, daß jede Verbindungsvorrichtung (3) aus einer Platte (3c) in der Form des Querschnitts der Lamelle besteht die an einer rechtwinklig dazu stehenden Platte mit einer rechteckigen Öffnung (3a2) befestigt ist, die durch Druck mit einer anderen Platte der gleichen Form mittels kleiner Zapfen (3b3) verbunden ist.

7. Eine zusammengesetzte Jalousie wie in Anspruch 1 beschrieben, gekennzeichnet dadurch, daß das Gleiten der Zahnstange (13) zur Drehung der Lamellen (2) mittels eines Knopfes (16) oder einer Vorrichtung (17) mit einem in der gewünschten Position blockierbaren Griff (17a) oder mittels eines mit der Verbindungsvorrichtung (3) oder 3/1) verbundenen Hebels ausgeführt werden kann.

8. Eine zusammengesetzte Jalousie wie in Anspruch 1 beschrieben, bei der jede Lamelle (2) aus zwei Hälften (8a und 8b) mit zwei Flügeln (8a1 und 8b1) zur Einführung in die Nuten (8c1 und 8c2) eines Zwischenstückes aus Plastik (8c) und einem Hohlraum (8c3) dieses Zwischenstücks besteht, der die Verbindung mit den beiden Enden der Blockiervorrichtungen (3) erlaubt.

Revendications

1. - Jalousie destinée notamment à être logée à l'intérieur d'un cadre (15) en aluminium d'une fenêtre ou d'une porte vitrée, comprenant un cadre périmétral (1) ayant ses éléments constitutifs verticaux et horizontaux formés par des profilés standard de section adéquate, une pluralité de lames (2) et des moyens logés à l'intérieur des éléments constitutifs verticaux dudit cadre périmétral (1) pour entraîner en

rotation les lames (2) entre une position ouverte et une position fermée, ledits moyens comprenant, pour chaque lame, un élément de roue dentée connecté à ladite lame de façon à l'entraîner positivement en rotation et engrenant chacun respectivement avec un élément individuel de crémaillère glissant (13), ledits éléments de crémaillère étant couplés pour se mouvoir simultanément, caractérisée en ce que chaque élément de crémaillère (13) est logé dans un réceptacle à crémaillère (11), un tel réceptacle à crémaillère étant prévu à chaque extrémité de chaque lame (2), chaque réceptacle à crémaillère (11) logeant aussi ledit élément de roue dentée lequel présente la forme d'un secteur denté (12); en ce que chaque secteur de roue dentée présente un trou biseauté à section non-circulaire (12b) recevant un pivot de forme biseautée complémentaire (4) d'un dispositif d'accouplement (3) monté sur chaque extrémité de chaque lame (2), chaque pivot d'accouplement (4) étant poussé par un ressort (14), dans le dispositif de couplage (3), afin de retenir le pivot (4) dans le trou biseauté (12b) du secteur de roue dentée (12) et afin de maintenir les éléments constitutifs verticaux du cadre périmétral (1) contre le cadre de la fenêtre ou de la porte, et en ce qu'elle est prévue une paire de lames fixes (6, 7), chacune d'elles étant reçue dans une ouverture (1e) pratiquée respectivement dans les éléments constitutifs supérieur et inférieur du cadre périmétral (1).

2. Jalousie selon la revendication 1, caractérisée en ce que lesdits éléments constitutifs verticaux sont connectés audit cadre (15) moyennant l'insertion de deux ailettes (1d) du profilé à l'intérieur de deux ailettes (15a) du cadre (15).

3. Jalousie selon la revendication 1, caractérisée en ce que les lames (2) peuvent être entraînées en rotation entre 0° et 180° en choisissant un secteur de roue dentée d'un angle variable entre 0° et 180°.

4. Jalousie selon la revendication 1, caractérisée en ce que les lames (2) peuvent présenter une ou plusieurs interruptions de la conduction thermique. 5. Jalousie selon la revendication 1, caractérisée en ce que chaque réceptacle à crémaillère (11) est formé de deux parties (11a) exactement identiques et connectées ensemble, chaque secteur de roue dentée présente un trou coaxial (12b) qui reçoit le pivot (4) du dispositif d'accouplement (3) et chaque élément de crémaillère (13) est pourvu, à une extrémité d'une appendice (13a) et à l'autre extrémité, d'une rainure (13b) ayant la même forme pour permettre la connexion l'un à l'autre de plusieurs éléments de crémaillère (13) de façon à former une longue barre de crémaillère sans interruptions.

6. Jalousie selon la revendication 1, caractérisée en ce que chaque dispositif d'accouplement (3) est constitué d'une plaque (3c) de forme similaire à la section droite d'un desdites lames (2), solidaire avec une plaque

(3a), perpendiculaire à celle-ci et ayant une fente rectangulaire (3a2), à laquelle est couplée à force une autre plaque (3b) de la même forme moyennant des petits crochets (3b3).

7. Jalousie selon la revendication 1, caractérisée en ce que le mouvement glissant de la crémaillère (13) pour entraîner en rotation les lames (2) peut être réalisé moyennant un bouton (16), ou un dispositif (17) pourvu d'une manivelle (17a) pouvant être bloquée dans une position préférée ou moyennant un levier connecté aux dispositifs d'accouplement (3) ou (3/1).

8. Jalousie selon la revendication 1, dans laquelle chaque lame (2) est formée par deux demi-lames (8a) et (8b) ayant des allers (8a1) et (8b1) insérés dans des rainures correspondantes (8c1) et (8c2) d'un profilé intermédiaire en plastique (8c); une cavité (8c3) dans ledit profilé intermédiaire en plastique, permettant l'accouplement, aux deux extrémités de celui-ci, des dispositifs d'accouplement (3).

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